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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,791	12/08/2003	Kia Silverbrook	ZF117US	8940
24011	7590	07/12/2005	EXAMINER	
SILVERBROOK RESEARCH PTY LTD 393 DARLING STREET BALMAIN, 2041 AUSTRALIA			MRUK, GEOFFREY S	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/728,791

Applicant(s)

SILVERBROOK ET AL.

Examiner

Geoffrey Mruk

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "58" has been used to designate both heat energy and heater layer. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Furlani et al. (US 6,464,341 B1).

With respect to claim 1, Furlani discloses a thermoelastic actuator (Fig. 13, element 15) assembly including: a heat conductor (Fig. 13, element 22) positioned to conduct heat (Fig. 13, elements  $Q_s$  and  $Q_l$ ) generated by a heating element (Fig. 13, element 24) away from said actuator assembly thereby facilitating the return of the actuator to a quiescent state subsequent to operation (Column 2, lines 66-67; Column 3, lines 1-12; Column 11, lines 30-60).

With respect to claim 2, Furlani discloses the heating element (Fig. 13, element 24) comprises a heating layer, the heating layer bonded to a passive bend layer (Fig. 13, element 23) and wherein the heat conductor is located within the passive bend layer.

With respect to claim 3, Furlani discloses the heat conductor (Fig. 13, element 22) comprises one or more layers (Fig. 13, elements 11 and 14) of a metallic heat conductive material located within the passive bend layer (Column 14, lines 8-14).

With respect to claim 4, Furlani discloses the one or more layers of metallic heat conductive material is sufficient to prevent overheating of ink in contact with said actuator (Column 1, lines 50-61; Column 2, lines 34-59).

With respect to claim 5, Furlani discloses the one or more layers of metallic heat conductive material comprise a laminate (Fig. 13, element 15, i.e. actuator structure) of heat conductive material and passive bend layer substrate (Fig. 13, element 23).

With respect to claim 7, Furlani discloses ink jet printer including a thermoelastic actuator (Column 5, lines 26-38).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furlani et al. (US 6,464,341 B1) in view of Carey et al. (US 6,274,924 B1).

With respect to claim 6, Furlani discloses the one or more layers of metallic heat conductive material (Fig. 13, elements 11 and 14; Column 14, lines 8-14).

However, Furlani fails to disclose the one or more layers of metallic heat conductive material comprise aluminum.

Carey discloses "The massive slug 10 provides a low thermal resistance path to conduct heat away from the LED die 16. While the preferred embodiment employs a copper slug, other suitable materials include thermally conductive materials such as diamond, silicon, aluminum, molybdenum, aluminum nitride, aluminum oxide, beryllia or composites and alloys thereof. Alternatively, composites of molybdenum-copper and tungsten-copper may be used. Suitable thermally conductive materials include pure materials, compounds, and composites of silver, copper, diamond, silicon, aluminum, tungsten, molybdenum, and beryllium" (Column 2, lines 47-58).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the heat sinking materials disclosed by Carey in the heat sink portion (Fig. 13, element 11) of the substrate disclosed by Furlani. The motivation for doing so would have been "Because the LED die is thermally coupled to the heat sinking slug, the die can be maintained at a junction temperature lower than conventional packages. The lower operating temperature maintains reliability and performance under high-power conditions because the die is not subject to high thermal stress" (Column 2, lines 36-41).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is (571) 272-2810. The examiner can normally be reached on 7am - 330pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Art Unit: 2853

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GSM  
7/7/2005

GM

  
7/8/05  
MANISH S. SHAH  
PRIMARY EXAMINER